THE CHEMIST

SEPTEMBER, 1947 VOLUME XXIV, No. 9

LAWRENCE H. FLETT

(See page 379)

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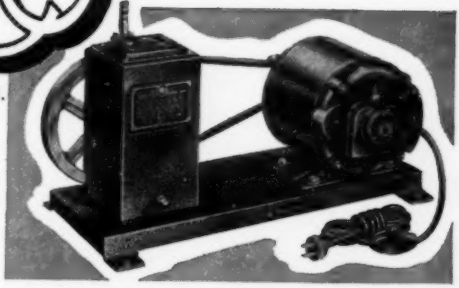

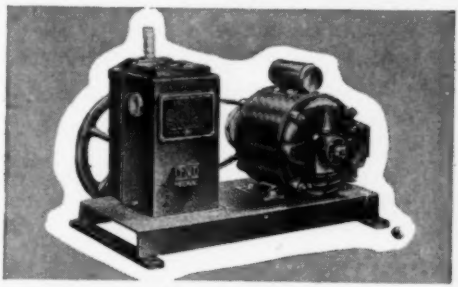

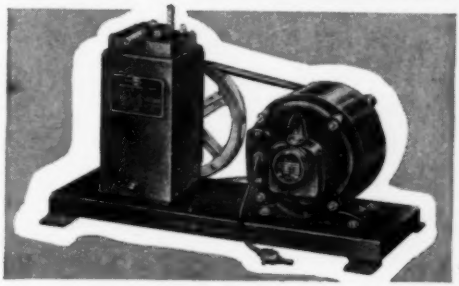

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The Chemist

Publication of

THE AMERICAN INSTITUTE OF CHEMISTS, INC.
60 East 42nd Street, New York 17, N. Y.

Volume XXIV September, 1947 Number 9

Entered as second class matter April 8, 1936, at the Post Office at New York, N. Y., under Act of August 24, 1912. Issued monthly at 60 East 42nd Street, New York 17, N. Y. Subscription price, $2.00 a year. Single copy, this issue $0.25.

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"Organization", by W. Nye Smith, Jr.

"Visit to a Flax Paper Mill."

Report of the Chicago A.I.C. Chapter Committee on Professional and Economic Status

Other articles of professional interest.

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...and a Building Endure

CALCIUM, the same element that causes eggshell hardness, is one of the main components of the limestone that enables a great edifice to stand through the ages. The characteristic firmness of various calcium salts is the one property that makes these diverse substances essential to the framework of both living and inanimate things. Calcium derivatives which are an essential part of the animal skeleton and the earth's crust, play a vital rôle in today's industries, including: ceramics, enameling, tanning, dyeing, and the manufacture of bleaches, paper, fertilizers, and medicines.

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Organizing a Research Department

Dr. Johan Bjorksten, F.A.I.C.

Bjorksten Research Laboratories, Chicago, Ill.

RESEARCH departments are set up for many reasons:

Sometimes for display

Sometimes for insurance

Sometimes for tax reasons

Most importantly, for developing and improving products in the line of operation of the firm.

Since we cannot now cover all possibilities, let us consider the most normal one, that of setting up a department for the *bona fide* purpose of developing and improving products in the line of operation of the firm.

The first step will be to find a good head for the research department. Too much care can never be given to this selection, as it will determine the success of the entire program and the return on the research investment.

To go into the selection of men would take us too far afield. However, one point seems to deserve emphasis. In interviewing men for the position of chief chemist, there will always be a good percentage of the applicants who state that their main reason for seeking the position is that "they do not care to work at a laboratory bench all their lives." Others may think differently, but I strongly feel that those whose main motivation is that they want to get away from the laboratory bench should be counted out when it comes to filling the position to head a newly organized research department. They may be excellent men in many other types of executive positions, but the man to head the newly established research department of moderate size must be willing, nay anxious, to hold the test tube in his own hand and to become personally familiar with the experimental details of all problems.

First-hand knowledge of the reactions, through our own eyes and fingers, can never be replaced by written reports, and the man who seeks desk work has the wrong motivation for this type of position.

In the newly established research department, it is a good procedure to let the man selected as chief chemist start out alone, or with one assistant, and then add to his staff just as rapidly as he becomes familiar with the problems, until the organization has reached the size planned. In this man-

ner, no new men will be added to the staff, until the time is ripe and until the other members are fully familiar with their tasks.

In the new research department, there is always a danger of too many small problems being brought in that are regarded as urgent. These must be handled, of course, but precautions should be taken lest these small problems monopolize attention, and prevent handling of larger key assignments.

Such provisions may include assigning one man to the major problem exclusively, and shielding this one man from all secondary problems.

Among firms having large research experience there is pretty good agreement that to properly utilize a chemist's skill and time, each senior chemist should have, on the average, one and one-half assistants, and six-hundred square feet of space. This may serve as a guide in calculating space allotments.

Further, it is a well-recognized principle of management engineering, that no person should have more than seven others reporting to him directly. In research, five are about the maximum desirable. It is important that the man in charge be not entirely absorbed in supervisory duties, but have time open for planning and for idea work.

Mr. Tom Girdler, chairman of the board of Republic Steel, was asked by a Congressional committee how many persons reported to him. His answer was: "Three. One secretary, one president, and one airplane pilot."

For the chief chemist in a newly organized research department, three persons reporting directly seems to be a good figure: one secretary and two senior chemists. Each of the senior chemists might have one or two assistants reporting to him.

Later, as expansion proceeds, the senior chemists would receive additional assistants and become group leaders, and their assistants would be promoted to senior chemists when qualified, so that the organization would grow organically from below, without ever giving any one man so many persons to supervise that his attention becomes too diluted.

I have dwelt at this length on personal aspects, because they overshadow everything else in importance. The right men will produce results anywhere, and given leeway will mold their surroundings to serve them efficiently.

Certain points might be brought out regarding space and equipment. Where a choice exists as to location of space it is preferable to have it as far away as possible from the production facilities. Having the research laboratory too close to the plant tends to create many kinds of interruptions, and, possibly, even clashes in policy. However, in starting a new research department, it is usually necessary to fit plans into existing space.

Usually, it is best not to anticipate equipment but to buy it when it is needed, and then to buy not too little, and the best quality. Time is worth so much more than equipment that it is almost economical to see to it that equipment never becomes a bottleneck preventing the fullest utilization of time.

The layout of the laboratory should be made with the definite and concious aim to save steps and motions. Much time is saved by having mobile units that can be connected and assembled to fit specific setups. Safety rules should be established and enforced from the outset.

In the management of a plant, a laboratory, or—for that matter—anything, it is always desirable to have a constant level of operation. Peak loads always create a problem. If staff, space, and equipment are expanded to handle an exceptional peak load, any following decrease in activity may lead to unused facilities, and possibly even to a necessity for reducing the staff.

For this reason in particular, it is advantageous to assign peak loads to an outside research firm, which specializes in such services.

In this fashion, the home research organization can be planned on a stable basis, to take care of the projected minimum requirements. What exceeds these can most economically be delegated to an outside institution which then, of course, will agree to assign all inventions to the organization and to serve no one else in this particular field of activity. The outside organization then functions flexibly, as a department of the company's research organization and takes its orders from the chief chemist. When there is a temporary letdown in business, the project at the outside organization can be discontinued without any disturbance at the home organization. When the next peak load is at hand, the outside organization can be called in again, and will then start with the benefit of experience from the previous assignment. Such a continuity of connection is worth much and, obviously, would be lost if necessary contractions were effected by laying off men from the home laboratory.

As an example, the itemization of expenses for one particular laboratory are listed as follows:

Research Director	$ 8,200
Senior Chemist	4,600
Chemist	3,600
2 Junior Chemists	5,400
1 Technician	2,000
1 Secretary	2,200
Salaries	$26,000
Overhead	26,000
Equipment	5,000
	$57,000
Outside Organization	9,600
	$66,600

Summarizing, the research department will stand or fall with the quality of its leadership.

When a capable chief chemist or research director has been appointed, he should be given sufficient leeway. Research is not an overnight proposition. Usually it takes several years for a research result to be translated into production.

The reward of a successful research program is leadership in the industry.

It is not by chance that the strongest firms today are those which throughout their history have had an aggressive and forward-looking research policy.

New Chemical Company

The DeLamar-Hendrey Chemical Company, Inc., has been organized in Chicago to act as distributors and brokers of chemicals, chemical specialties, and essential oils.

The principals are Robert DeLamar, A. M. DeLamar, and Dr. Waldersee B. Hendrey, F.A.I.C. Robert and A. M. DeLamar have been partners in the firm of J. H. DeLamar & Son. Dr. Hendrey has been vice president and sales manager of the Edwal Laboratories, Inc.

The new firm will continue the business of J. H. DeLamar & Son as distributors, and will add the materials manufactured by the Edwal Laboratories to the chemicals handled by this company.

Shea with Naval Medical Research Institute

Lieutenant Commander Thomas Emmett Shea, Jr., M.A.I.C., is now a member of the staff of the Naval Medical Research Institute, Bethesda, Maryland, as officer-in-charge of the Industrial Hygiene Facility and temporary chief of the Pharmacology Facility.

In 1942, he was commissioned in the Naval Reserve. He saw service in Europe and Africa with the 8th Amphibious Corps and with the 10th Army at Okinawa. He was then sent on a cruise to the Arctic Archipeligo north of the Canadian Arctic.

He recently completed a series of studies on methyl alcohol toxicity with Drs. Hine and Blakimore, reported at the Federation of American Experimental Biologists in Chicago in May. At present he is principle investigator on the toxicity of silicones when used as insulation on electrical equipment.

The Chemical Exposition

Space reservations for the Exposition of Chemical Industries, to be held in Grand Central Palace, New York, N. Y., December first to sixth, already cover the four floors available. There is a noteworthy increase this year in the number of exhibits of chemicals in addition to more comprehensive displays of processing equipment.

The Atomic Age of Promise

Dr. Cloyd Heck Marvin,
President, The George Washington University

(Excerpts from an address given before the Washington Board of Trade.)

WE seem to live in a world of contradictions. The very achievements that exalt the world threaten to destroy it . . .

Deep in the hearts of all men the basic question is, how can the scientific advances made by men be harmonized with the understanding in the humanities that must support the advances if they are to aid Mankind? All thinking must be given new emphasis. We need new methods. All this has been brought home to us with the advent of the atomic bomb.

Acknowledging that there have been basic changes in the character of the problems of the world, how do they differ from those of yesterday? They are more involved and more complex, but more than that, they cover greater areas of human experience. When I was a boy on the farm, we used to debate what day we would chop the wood and "rack it up in the woodshed." How simple such a decision was compared with the involvements of a coal strike. Yet the fundamental principle is constant — if we do not have fuel we are cold.

These complexities require a method of thinking that can deal satisfactorily with component parts and interrelated specializations. Such specialized thinking might be likened to an assembly line where every individual contributes his part. All problems become related and a part of a single whole. The atomic energy problem affects the Russian political system, biological changes, economic stability, and "world understanding." We must learn to think in a four dimensional continuity.

The nagging demands of life surround us. There is no relief from the pressure upon us. There is scarcely a moment for individuals to adapt themselves to the new type of thinking. It must be learned on the run. Is it any wonder that, tired from the physical and emotional strain of war, called upon for the expenditure of the meager marginal strength left to mankind, and being drained by this constant need, not only for new ideas, but for the means of arriving at these new ideas, that some men have been baffled?

Our problems are not easy problems of differentiating between good

and bad. The thinking of men has carried us in most instances to where we must deal with the complex choices between different conceptions of what is good. Fresh observations born of the passing of the reluctant past, with the eager demand of the future, must be recognized. Insofar as we do this, fear and confusion and mistrust will tend to disappear.

"Careless seems the Great Avenger,
History's pages but record
One death grapple in the darkness
'Twixt old systems and the world,
Truth forever on the scaffold,
Wrong forever on the throne;
But the scaffold sways the future,
And behind the dim unknown,
Standeth God within the shadow,
Keeping watch above his own."

However difficult it is to think in new ways, we are compelled to do so by the same elements that cause current confusion and fear. You have stood watching a great storm approaching, the dust and the torn leaves whirling through space carried in the first gusts of the wind; watched the trees dashed by the wind; heard the thunder; and felt the torrential rains beat the grass at your feet. It all seemed chaotic, and yet the drops of rain that fell were a heaven-sent solvent that picked up the gasses of the air, the minerals and colloidal sustenance of the mud, and carried them down to the roots of the plant at your feet. Then with the clearing of the storm and the reappearance of the sun, the raindrops returned through the roots to the tiny clover plants to make them strong and cause them to bloom for your joy, and that other plants of a like kind might come after. So confusion and discomposure, accompanied by mistrust and fear, sweep aside outmoded forms of thinking and what was confusion becomes order and composure.

We live in an era when men's minds are tired, as they were tired after the fall of the Roman Empire when St. Augustine wrote "The City of God," and in the restless days in Europe when Erasmus translated the New Testament. But men lived through those great periods of change and stress to bring honor to advancing civilizations. So in our day of urgency, great capacity will come to us as we gain power to think on the appropriate level and in a humanistic way.

Sound theory is the most practicable thing in the world. So let us apply the suggestions I have made in regard to changes in our thinking patterns by discussing the atomic bomb and its effects.

Darkness covered the lonely New Mexican desert, spotted here and there with its mangy tarweed. It was the morning of July 16th in the year 1945. A small group of men, many miles away from a steel tower that stood as the center of interest, watch-

ed eagerly, through heavy dark glasses, the instruments for which each was accountable. Darkening heavens, and the flash of lightning that came just before the zero hour, heightened the drama. At five-thirty the signal was given, the time for the detonation was now. Nerves were tense. There was the possibility of failure. There was the possibility of too great a success that might mean an uncontrollable weapon. Then the elongated object crashed from the steel tower to bring new man-made light to the earth. The flash marked mankind's transition to a new age. The name "Alamogordo" became synonomous with "a new world."

The story of fission goes back at least to 1919, and perhaps I should put the date as 1896 at the time of the discovery of radioactivity. The names of Becqueral, Curie and Rutherford, flash through my mind when I recall these dates.

In 1930 I was asked to lecture in Europe. At the University of London I came in contact with a comparatively new and rapidly growing body of thinking which was styled "Theoretical physics" in contrast to the field of classical and experimental physics. Here was a new plateau of thinking from which to look. Returning to this country I talked with Dr. John C. Merriam, then president of the Carnegie Institution of Washington.

He asked me to talk with Dr. Merle Tuve of his organization. As a result of the conference, The George Washington University brought to its membership Dr. George Gamow, a Russian-trained theoretical physicist, and Dr. Edward Teller, an Hungarian-trained physicist. Both of these men had studied in Germany and England. To them fell the task, along with Dr. Fleming and Dr. Tuve of the Carnegie Institution, of developing a theoretical physics seminar that would call together the great minds of the world in this field. The Carnegie Institution joined with The George Washington University in inviting these men to meet annually in Washington, beginning in the spring of 1935. Each time they met to discuss their problems and common experiences. Perhaps the dean of the group was Niels Bohr of Copenhagen.

In 1939 I recall Bohr telling me that he was particularly anxious to discuss a certain phase of the problem with Einstein at Princeton.

Earlier that month, O. Hahn and F. Strassman had proved that an isotope of barium was produced by neutron bombardment of uranium. Two other German physicists, refugees at the time, O. R. Frisch and Lise Meitner, explained the original observation — they suggested that "the absorption of a neutron by a uranium nucleus sometimes caused that nucleus to split into approximately equal parts with the conver-

sion of some of the mass, by Einstein's 1905 formulation, into enormous quantities of energy, a process called fission."

Then in the third week of January, 1939, came the conference at The George Washington University. Publication of the results obtained by Hahn and Strassman in Germany allowed Bohr to announce the details of the discovery, which had come to him by personal communication. Thus on January 26, 1939, in a classroom of the University, "America first learned of the fission of uranium with the release of atomic energy." American physicists were quick to duplicate and verify the experiments.

A cry of horror went up when the bomb blasted and burned Hiroshima. Had this nation created something that was going to destroy mankind? What controls were available? Lengthy arguments were given that there could be no controls; when, if we had stopped to reason, the control of atomic energy was to be found in the minds that discovered it. For instance, if fission took place in uranium, would the chain reaction carry over into other physical relationships, such as nitrogen of the air? And if so, what would likely be the results?

At this point there comes to my mind a conference table at which the principles were again being established — I see a hand figuring and figuring, page after page being used up in numbers and in the formulae of calculus to answer the problems. The answer came that there could not be a carry-over, but if nitrogen could be transformed it would take less than two seconds for the atmosphere of the air as we know it to be destroyed. We might suppose that the face of the person whose hand was making those figures was a venerable one, having marks of deep concern graven thereon. Our supposition would be wrong — the face was that of a youth of nineteen who was making the computations that ultimately would be returned to the conference table for review. The average age of those about this table was twenty-seven. A Youthful mind was establishing the first control.

The discovered force in fission, I believe, is but the beginning of a glorious future, which, while it must be gained over a long and strenuous path, will enlarge and enhance the value of the minds working thereon. The discovery of fission, while it ushered in a new world, was just as natural a discovery as that made by primitive man when he tied a stone on the end of a stick with rawhide in order to create a hammer. While the earliest men must have feared the chap who invented the first hammer, we are glad for his genius as we all use hammers today.

Until January 26, 1939, we were creatures of the sun, for we lived in a world in which practically all energy has its derivation from the

sun. Our development depended upon the radiation that filtered through space to this planet we call the earth.

Now we are able to create a new power. The amount of Uranium U-235 is limited and if we were to use all available in known deposits, it would only run industry for a few years before it became exhausted. But by using a combination of thorium and U-238, another isotope of uranium, we have access to much more nuclear energy.

It makes little difference with what problem we start — the selection of the approach is only a matter of emphasis. All problems lead back to two — how to get a living, and how to live together. These two questions are but a simplification of the basic question, "How can the scientific advances made by men be harmonized with the understanding in the humanities that must support these advances if they are to aid mankind?"

This recollection causes us to ask, "What political forms will survive in this new atomic age?" Atomic energy has changed the political arguments of decades. Despite the present high cost and difficulty of handling fissionable material, atomic energy will soon bring a creative impulse that will free men's time, free their imagination, and free their power to create and work. It will provide basic needs in a large way. No longer will it be a question of whether the state or the individual is supreme. The individual will be dignified. The state will become the servant of men freed to fulfill their spiritual destiny. The democratic life will come into its own.

Arguments for or against "economic determinism" or the "revolutionary establishment of the proletariat" become puny when they are answered by the force of the universe. Nations voluntarily will increase cooperation in larger and larger areas of activity. Those who have avoided the international agreements necessary to forming a world state, in order that they might maintain their own sovereignty, will find sovereignty a hollow word when based on fear and discrimination, and a word of great significance when based on the creative impulse and cooperative endeavors.

Men living in such an order of freedom will not be willing to war upon one another. They will answer this problem through the establishment of a world government based on justice and the recognition of human rights. Atomic energy thus is destined to mean much for the betterment of humanity through a new conception of the state.

So our problems become our hopes. Life is not paradoxical if we have an over-all view. We are able to cope with our scientific inventions, but we must not try to put "new wine

in old bottles." . . . What men have invented they have always used for their betterment. If this were not true, man would not be confronted by the problems of today, for man would not exist.

Parker Now Assistant Research Director

Dr. Robert P. Parker, F.A.I.C., formerly in charge of the pharmaceutical section of the Research Department, Calco Chemical Division, American Cyanamid Company, has been appointed assistant research director. He joined Calco in 1933, just after he received the doctorate degree from Yale. He recently returned from several months in Europe as an investigator of German chemical industry.

"Equal Justice Under Law"

Roger W. Truesdail, F.A.I.C., president, Truesdail Laboratories, Los Angeles 31, California, in his house organ, "Chemistry in Action", recommends that educational and non-profit institutions which do research and testing for fees be taxed by the Federal and State governments. "We petition all tax authorities to examine the situation with respect to research and testing for commercial purposes. And if found proper, to equalize tax rates on all enterprises, whether of educational or commercial sponsorship that engage in such work."

Hovey in Charge of Technical Sales Service

Almon G. Hovey, F.A.I.C., has been appointed in charge of Technical Sales Service of the Chemical Division of General Mills, Inc., Minneapolis, Minn. He has been with General Mills for three years, serving on the research staff, in charge of the New Chemicals Development Section. He was formerly with Reichhold Chemicals, Inc., in charge of the Patent Division and the Coating Resin Division.

Fluid Dynamics

The Graduate Divisions of New York University and Stevens Institute of Technology are offering, jointly, a program of study leading to the M. S. degree in Fluid Dynamics of aircraft, ships, and related bodies. Information may be obtained from H. J. Masson, New York University, University Heights, New York 53, N. Y., or R. H. Baker, Stevens Institute of Technology, Hoboken, N. J.

G.B. Hafer, general sales manager, J. T. Baker Chemical Company, announces that H. B. Rasmussen, formerly manager of the Chicago office, has now taken up his new duties as sales manager, Laboratory Chemical Division, of Baker Chemical at Phillipsburg, New Jersey.

Recognition Given Professional Employees in New Labor Law

Walter J. Murphy, F.A.I.C., recently called attention to the legal recognition of professional employees afforded by the Taft-Hartley Law. His editorial is given here through the courtesy of *Chemical and Engineering News*.

SOME aspects of the new Labor Management Relations Act (Taft-Hartley law) that have been almost entirely overlooked in the heated controversial discussions in the general press are of great importance and interest to chemists, chemical engineers, and, in fact, all professional employees. These are the provisions of the new law which define the term, "professional employee," and give to such employees the right to form bargaining groups made up entirely of professional men, or to join with nonprofessional employees, if that is their desire.

In Section 2, paragraph 12, the law states:

> The term "professional employee" means—
>
> (a) any employee engaged in work (i) predominantly intellectual and varied in character as opposed to routine mental, manual, mechanical, or physical work; (ii) involving the consistent exercise of discretion and judgment in its performance; (iii) of such a character that the output produced or the result accomplished cannot be standarized in relation to a given period of time; (iv) requiring knowledge of an advanced type in a field of science or learning customarily acquired by a prolonged course of specialized intellectual instruction and study in an institution of higher learning or a hospital, as distinguished from a general academic education or from an apprenticeship or from training in the performance of routine mental, manual, or physical processes; or
>
> (b) any employee, who (i) has completed the courses of specialized intellectual instruction and study described in clause (iv) of paragraph (a), and (ii) is performing related work under the supervision of a professional person to qualify himself to become a professional employee as defined in paragraph (a).

And in Section 9b:

> The Board (National Labor Relations Board) shall decide in each case whether, in order to assure to employees the fullest freedom in exercising the rights guaranteed by this act, the unit appropriate for

the purposes of collective bargaining shall be the employer unit, craft unit, plant unit, or subdivision thereof: Provided, That the Board shall not (1) decide that any unit is appropriate for such purposes if such unit includes both professional employees and employees who are not professional employees unless a majority of such professional employees vote for inclusion in such unit.

The establishment of these provisions clears up a fundamental difficulty with the Wagner Act as it affected professional employees. It is now clearly recognized that professional and nonprofessional employees have distinct and divergent problems in their relationships with employers because of their inherently different educational backgrounds, training, and work interests.

Professional services are predominantly intellectual, with a constant demand for originality and creative thought in the solution of each new job. Individual talents vary, and each member of a profession strives individually to improve his knowledge and abilities for his own personal betterment and the advance of his science and profession. From the nature of his services, he does not fit into a standard work pattern which is suited to skilled or unskilled manual labor.

The failure to recognize and provide for this in the Wagner Act frequently resulted in unhappy situations where a small minority group of professional employees were roped into heterogeneous units against their wishes. In some cases the professional groups had to organize their own collective bargaining units to avoid being included in unions where they would have practically no influence and whose decisions in many cases were diametrically opposed to the views of the professional group.

During the framing of the new law and the Congressional hearings on it, the ACS and other scientific and engineering groups presented statements and gave testimony concerning suitable provisions for professional employees. It is gratifying to report that both the House and Senate Committees gave serious attention to these suggestions. The resulting legal recognition of their rights and the specific protection of their interests should free professional employees from many of the unnecessary and unpleasant entanglements with which they struggled under the Wagner Act and thus improve relationships with both labor and management.

Monsanto Chemical Company announces the completion of its new $3,000,000 plant at Monsanto, Illinois, for the manufacture of Santomerse No. 1, a synthetic detergent.

Australian Chemists' Code of Ethics

The Australian Chemical Institute, Melbourne, Australia, has adopted the following revised Code of Ethics.

1. If any person while he is a Member of the Institute:

(a) Allows any person not being either a Member of the Institute or in partnership with himself as an Analytical or Consulting Chemist to practise in his name as an Analytical or Consulting Chemist; or

(b) Is convicted of felony or misdemeanour or is finally declared by any court of competent jurisdiction to have committed any fraud; or

(c) Is held by the Council on the complaint of any members of the Institute or of any person aggrieved to have been guilty of any act or default discreditable to the profession of Analytical or Consulting Chemistry; or

(d) Is adjudged bankrupt or individually or as partner makes an assignment for the benefit of creditors or under the Order of a Court of Bankruptcy or under any deed or document has his estate sequestrated or placed in liquidation for the benefit of Creditors or makes any arrangements for payment of a composition to Creditors; or

(e) Shall engage in any occupation which in the opinion of the Council shall be inconsistent with his remaining a Member of the Institute; or

(f) Fails to pay any subscirpition or other sum payable by him to the Institute for one year after the same has become due; or

(g) Fails after suspension to deliver up his certificate of Fellowship or Associateship to the Council upon demand:

Such person shall be liable to be excluded from membership or to be suspended from membership for any period not exceeding two years by a resolution of the Council . . . (Extract from Charter)

2. A member of the Institute shall endeavor to advance the profession of chemistry and shall be honourable in his professional dealings with all members of the public.

3. A member shall not make disparaging remarks or unwarranted comment about other members.

Reasonable criticism of a member's conduct or views made at any meeting

of the Institute, or a committee of the Institute shall, however, be privileged.

4. (a) A member shall not issue or publish, or allow to be issued or published:

(i) A certificate of purity or superiority which is not based upon the results of an analysis; or

(ii) A certificate which contains an exaggerated or irrelevant or merely laudatory expression; or

(iii) Any certificate unless it is accurate and complete, includes the date of the analysis and the nature of the sampling, and distinguishes clearly between the facts and the analyst's interpretation of the facts.

(b) A member shall not allow his name to be associated with a misleading advertisement nor with a statement which makes an unfair comparison between his firm's product and the product of another manufacturer.

(c) A member whose certificate is published without his consent or is published with words omitted or is published in a form which makes it unethical, shall report the circumstances to the Registrar and enable the Council either to act in any way which may stop further publication or to publish the full certificate in its proper form.

5. A member shall be conservative in all estimates, reports, testimonies and other statements, especially if these be in connection with the promotion of a business enterprise.

6. (a) A member shall not advertise his professional services except in a dignified manner.

(i) by publishing an announcement of such information as his starting practice or his changed address in a daily newspaper or other publication.

(ii) by publishing a professional card in one or more scientific or technical but not other publications, stating, if desired, name, address, branch or branches of chemistry in which he considers he is specially qualified.

(iii) by sending a letter, circular or other communication* which directly or indirectly solicits work from a prospective client, provided such communication is accurate and does not attempt to take a client away from another practitioner.

(b) A member shall not advertise his fees, but, should the Institute publish a schedule of fees, a statement that the adheres to this schedule would be ethical.

(c) A member shall not have his name or the name of his practice printed in a classified telephone directory except in a manner uniform with that of all other members and their practices.

7. A member shall not use any unfair, improper or questionable methods of

*Members are invited to submit drafts to the Council.

securing professional work or advancement.

8. (a) A member shall not charge a fee for analytical or consulting work which is not enough to enable adequate service. Time, labour, experience and skill required, loss of other work while engaged on it, the customary charges of other chemists for similar work, whether it is casual or more permanent, should be considered in fixing the fee for a professional service.

(b) A member having stated a fair fee to a client shall not, unless for very good reasons, reduce this fee at the client's request.

(c) A member shall not reduce his usual fee for professional service in order to compete with another member for work.

Fundamental Research

Dr. Charles Allen Thomas, F.A.I.C., executive vice president of Monsanto Chemical Company, has instituted the position of senior industrial scientist at Monsanto, to encourage fundamental scientific research. Dr. Thomas explained that the United States must lead in scientific discovery if it is to survive. The position of senior scientist will give freedom for original research, divorced from limited industrial activity. The first appointee to this new position is Albert H. Bump, assistant research director of Monsanto's Merrimac Division at Everett, Mass.

New Atomic Laboratory

Work has been started on the Atomic Energy Commission's $20,000,000 research laboratory at Niskayuna, New York. Dr. C. G. Suits, vice president of General Electric Company, will direct the new laboratory, which is dedicated to the development of atomic energy for peacetime use.

Young Graduates in Demand

Columbia University's Placement Department reports that graduates are eagerly being absorbed by industry, which is short of young men. Salaries are definitely better than before the war. Formerly a Ph.D. in chemistry received $3,200 a year. Today he starts at $4,200 to $4,800.

Dr. Gustav Egloff, F.A.I.C., addressed the Institute of Chemistry Symposium, July 8th, at St. Andrews, Scotland, and then presented five papers at the 11th International Congress of Pure and Applied Chemistry, July 17th to 24th, in London. His schedule also included a lecture before the Societe Belge Pour l'Etude du Petrole, Brussels, Belgium; an address before the University of Delft, Holland; visits to France and Czechoslovakia, and attendance at the London meeting of the Permanent Council of the World Petroleum Congress.

Again . . . the Baker & Adamson Division of General Chemical Company makes another advancement in packaging reagent chemicals.

Its exclusive new 9-bottle case for B&A Reagent Acids and Ammonia is a package offering advantage after advantage over commonly used cases. It saves space and money; it is easier to handle and store. Note the outline of its important features . . . consider what they can mean in terms of economy and convenience in your laboratory or plant.

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We Present the A. I. C. Chapters

The objectives of THE AMERICAN INSTITUTE OF CHEMISTS are carried out locally through its twelve chapters. These chapters will be presented to our membership from time to time in THE CHEMIST.

The New York Chapter

Lawrence H. Flett, *Chairman*

The New York Chapter wants to bring home to each chemist the realization of his professional responsibilities. It feels that the chemist can improve himself and his value to his company by better understanding the fields of opportunity open to chemists and by a friendly relationship with his fellow members in The American Institute of Chemists.

For the forthcoming year, it plans to encourage friendship among its members. The meetings will be directed toward subjects of interest to the chemist, but will not embrace any scientific discussions which properly belong to the technical societies.

A particular effort will be made to improve relations with the schools in the New York area and with the students. Every effort will be made to make meetings as profitable and as pleasant as possible to the younger members, who will be encouraged to participate in the operation of the New York Chapter.

The New York Chapter has been unusually fortunate in that its members participate enthusiastically in the Chapter's activities, as well as in the activities of the National Institute. A recent meeting of the New York Chapter is reported on page 380 of this issue of THE CHEMIST.

The other officers and the committee chairmen of the Chapter are: vice chairman, Dr. L. W. Seigle; secretary-treasurer, Dr. Martin Meyer; chapter representative, J. J. Miskel; Councilors: Harry Bennett, Dr. W. H. Gardner, Logan D. Grupelli, Dr. Hugh B. Hodge, Jr., Dr. John E. Schott, Dr. Harvey Seil, and Byron Thompson.

Committee chairmen: Program, James W. H. Randall; Membership, Louis Koberlein; Arrangements, Dr. Maurice G. Kelley; Young Members, Charles P. Neidig; Mailing, Harry Bennett; Reception of Speakers, Robert B. Boyd; Medal, Dr. Donald Price; Student Relations, Karl M. Herstein; Greeting, Dr. Charles E. McGinn, and Publicity, G. A. Kirton.

The New York Chapter's Chairman

Lawrence H. Flett is director of the New Products Division of National Aniline Division of Allied Chemical and Dye Corporation, 40 Rector street, New York, N. Y.

Personally active and aggressive, Mr. Flett works diligently, but he enjoys contacts with his fellow chemists and devotes much effort to the activities of the scientific and professional societies.

After his graduation from Massachusetts Institute of Technology in 1918, he started as research chemist with National Aniline and Chemical Company. The American dyestuff industry was then in the infant stage, and Mr. Flett recognized the opportunity it afforded to chemists. He next spent two years with Atlantic Dyestuff Company, and then, in 1922, became research chemist for National Aniline in Buffalo. Mr. Flett's ability, versatility, and mental flexibility, enabled him to contribute generously, from original research work on dyes and intermediates to the development of operating techniques and processes.

When the depression arrived, the company wisely decided upon a research program to develop new products. Not satisfied with the successful outcome of his dyestuff program, Flett worked even harder to develop the first stable synthetic detergent and the first detergent prepared from petroleum. He holds over seventy-five patents in the fields of detergents, dyestuffs and intermediates, and miscellaneous materials. As a result of this work, he is now regarded as a leader in his field. In recognition of his ability in industrial research he was awarded the Schoellkopf medal of the Western New York Section of the American Chemical Society.

In 1944, Mr. Flett was transferred to the New York Office of the company. While in Buffalo, he had served as chairman of the Niagara Chapter of the A.I.C., and the reputation of his enthusiastic leadership followed him to New York. After serving on the New York Chapter program committee, and as chapter representative to the National Council, he was elected in 1947 to the chairmanship of the New York Chapter. This year he was elected councilor-at-large by the National organization.

Mr. Flett is quick to see possibilities and opportunities. He believes that the future of the chemist is what he, the chemist, makes it. How to translate desire into activity and activity into the advancement of the profession is the nucleus of the New York Chapter's program for the coming year.

Books are waste paper unless we spend in action the wisdom we get from them.

——George Washington

Your Institute

"Your Institute" was the featured subject of a panel discusion held recently by the New York Chapter, A.I.C.

Dr. Lloyd Van Doren spoke on the organization's early history. (His paper will appear in an early issue of THE CHEMIST). Dr. Raymond E. Kirk discussed the "Objectives of the A.I.C."; Dr. Harry G. Lindwall, "Is There Anything Wrong with the Chemist?" C. P. Neidig, "What Younger Men Expect the INSTITUTE to do" (see THE CHEMIST, August, issue); Dr. Joseph Mattiello, "The Memberhip of the A.I.C.", and Dr. Foster D. Snell, "Future Plans".

The Objectives

Dr. Kirk joined the INSTITUTE because his much admired professor told him, "The A.I.C. has good objectives and you will meet some fine people there." Dr. Kirk said that he agreed.

Though the objectives are printed in the directory of the INSTITUTE, Dr. Kirk decided to determine for himself what the objectives ideally should be for such a profesional association. After much thought, he drew up a list of objectives, "which I hope will not satisfy you, for you should think up your own list, but they satisfy me." They are:

1. To establish clearly the professional status of the chemist.
2. To establish a definite ethical basis for the conduct of professional chemists.
3. To promote a clear-cut appreciation by chemists of their role in society as chemists.
4. To recognize and signalize the achievements of chemists.
5. To promote the economic status of chemists.

He concluded, "The professional status of chemists is one of the things we are assembled together in this INSTITUTE to promote. There should be differentiation between the objectives and the implementation of the objectives—between the objectives and the means for achieving them."

What is Wrong with the Chemist?

"The chemist is not appreciated enough by those who are non-chemists," stated Dr. Lindwall. "One of the best things that could happen to American chemistry would be to have more chemists appointed to administrative positions in education. While we have some outstanding examples of this, in general only too few chemists find themselves in college administrative positions. Perhaps this is the reason why, for example, the B.S. de-

gree has become such a catch-all for all sorts of rubbish. I have heard of theses for degrees on such subjects as, 'Why Girls Leave Home' or 'Salaries in Weehawken'. This situation is only one illustration of what can happen when non-scientific people are in charge of policy-making.

"Why is it hard to hire a chemist? We have all kinds of people applying for positions to teach English, for example. The chemist on the other hand, has to have definite training. He has to know his subject.

"There should be some rating as to what constitutes a chemist. It should not be too difficult for a young chemist to understand that the A.I.C. serves as the best agency for the implementation of grading as to chemist.

"In general, I do not feel that there is anything wrong with the chemist except that he ought to hire a publicity agent."

Membership

Dr. Mattiello introduced his topic with two quotations from Dr. Clifford S. Rassweiler's article (THE CHEMIST July issue):

"In the case of the chemist . . . one cannot limit himself to that group of people who are actually dealing with chemical reactions or chemical processes, for many men and women with chemical training, who are commonly considered as active and important members of the profession, do not carry on, nor direct, a single chemical operation from one year's end to another..."

"One of the reasons for broadening opportunity is the growth of the chemical industry itself in this country. Not only are the companies which are carrying chemical reactions growing constantly in size but also there are an increasing number of businesses which depend more and more upon the carrying on of conscious chemical reactions The growth of the dyestuff industry following the first world war; of the plastic producing industries during the 1930's, and of synthetic rubber and chemical operations in the petroleum industry during this war are obvious illustrations of the increasing number of places where industry is dependent upon conscious chemical reaction for its success. This dependence means a constantly broadening area of opportunity for men with chemical training and experience."

"Frequent announcements," said Dr. Mattiello, "show that opportunities are continually broadening for chemists. Neidig told us that we should increase the number of younger men in the INSTITUTE. These young men should be kept informed about the broader opportunities open to those with chemical training. . .

"While we are increasing membership, we should give some thought to the establishment of more chapters to

encourage the participation of the younger men in our work. In another society to which I belong. I noticed a young man who had good ability which was dormant. I literally had to beg him to get up on the floor and talk. Finally he became active in the organization. As he learned to develop and use his ability, his own firm began to appreciate him, and his salary increased proportionately until he reached $4,000 a year before the war. I mention this to show that if young people will become active in their professional societies, they will frequently in turn be recognized by their employers, because by developing their own ability they have thus increased their value to their firm. . .

"We should strive for 20,000 members. Perhaps that seems a bit high for the present, but even if plans seem imaginative, let's go ahead. Everything we do brings us nearer to the goal. We must know that the INSTITUTE is fighting the battle for the chemist. We must hold to our faith and go ahead. At the close of the Marburg lecture, I stated that every technical person should join at least one professional society and thus be of greater value to himself, his employer, and his country.

"We want to show the younger men what the INSTITUTE can do for them professionally. We shall need the help of every one of you to bring in new members."

More Accomplishment

Dr. Snell agreed with the principle of obtaining more members, because "More members equal more budget, equals more accomplishment. Your officers can assure you that if you do the early part, we will do the latter part. . .

"The early history of the INSTITUTE brought out that the A.I.C. was planned to parallel the professional association of certified public accountants rather than that of the lawyer. Independently, I had presented this idea because it seemed to be something more possible of attainment.

"When we look back we can see many fine things which the A.I.C. has done—The report of the Committee on Employer-Employee Relationships; the Voorhees report on employment contracts; the report on "Termination of Employment;" the endeavors in behalf of the city chemists of New York; these are just some of the recent things which quickly come to mind as concrete achievments.

"There was a great deal of merit in the late lamented coalition. The Canadian chemists have coalesced their societies into one organization. Today three British organizations, one of which is the Royal Institute of Chemistry, are operating as a unit.

"We need more of the younger people in the A.I.C. We can do a great deal for them, and we want to include them in our plans for the coming year."

The Discussion Period

When the meeting was opened for discussion, an enthusiastic audience presented many interesting ideas.

Dr. Donald Price praised the New York Chapter's custom of having a "Greeter", who is charged with the responsibility of making the younger chemist feel at home. There he meets the older men and becomes oriented in the chemical world.

Dr. Marston L. Hamlin called attention to the system of the New Jersey Chapter, where small special group meetings are held to which younger chemists are invited to express their ideas. He outlined the efforts leading up to the report on Employer-Employee Relationships.

A. J. Nydick said that the A.I.C. should "battle for chemistry and the position of chemist with the zeal of the American Medical Association for the physicians.

Dr. Cornelia Snell, present as a guest, spoke for women chemists, when she expressed the hope that the A.I.C., or both the A.I.C. and the A.C.S., would continue to advise chemistry as a profession.

Walter J. Baeza, who is in charge of the Middle Atlantic States Regional Employment Clearing House of the American Chemical Society, stated that he comes into contact with many recent graduates and undergraduates. "They have not even a slight knowledge of what they are to do in industry, nor how it should be done. I blame that on the schools, but professors have little opportunity or time to instruct the students in professional attitudes and the economic values of what they are being taught. This group which is interested in the human side of the profession could not do better work than to tell these young chemists what the term 'chemist' actually means. . .I think we can do something here which is vitally needed by young graduates."

A motion was presented to appoint a committee to report a program for the younger chemists, and that the program be implemented to show young chemists what can be done for them.

Dr. Keyes suggested that only young people be appointed to this committee.

Dr. Hans Z. Lecher recommended that young speakers be included on meeting programs.

Thomas Michael O'Neill, Jr., speaking for young chemists, said that an opportunity, such as this meeting, to talk over things made the INSTITUTE'S value more clear.

A reporter who attends many scientific meetings suggested that a committee, which would draw up a list of employers who maintained professional standards for chemists, would be of great value to the young chemists, who frequently know nothing about the positions available to them.

Mr. Neidig emphasized that a young man does not become successful

simply because he joins a society. His recognition depends upon his taking part in the activities, preparing papers to be read, participating in the discussions, contributing ideas, etc. He should select those activities which develop his special talents.

Several persons enthusiastically expressed their interest in the work of the INSTITUTE, and in the ideas developed during the evening's program.

Science and Public Policy

PRESIDENT Truman's Science Research Board, which includes among its members, John R. Steelman, chairman, defense secretary James Forrestal, and twenty-nine other officials, reported, August 27th, after eleven months of study, that as a nation we should increase our annual research expenditures until in 1957 we are expending at least one per cent of the National income on research in universities, industry, and the government.

Heavier emphasis on basic research and medical research was recommended. Basic research expenditures should be quadrupled and those for medical research tripled.

The government was asked to support basic research in universities and non-profit research institutions at an increasing rate until, in 1957, $250,000,000 will be reached.

A national science foundation was recommended, "with a director appointed by and responsible to the President." Government scholarships to science students were advocated.

It was also recommended that efforts be made to assist in the reconstruction of European laboratories as part of our aid program. "On terms which require the restoration of conditions of free international exchange of scientific knowledge."

At present about $1,100,000,000 is spent annually on research and development in the United States, much of which is research of a military nature.

The report is entitled, "Science and Public Policy: A program for the Nation".* In his statement, President Truman declared,

"We must constantly enlarge the boundaries of scientific knowledge in order to continue to provide the benefits of full production and full employment. . . .

"The fact that only a thin trickle of scientific knowledge is today reaching us from other countries constitutes an emergency and a challenge. To meet this challenge, we must promote the rapid growth of basic re-

*Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price 20 cents.

search, the cross-fertilization of ideas among our scientists, and the maturing of a new generation of scientists who will think boldly and daringly. . .

"We must educate young people who will be able not only to apply known scientific principles to the peaceful development of new techniques in industry, agriculture and medicine, but who will have the creative ability and the scientific training to discover new basic principles themselves. . .

"I hope this report will be read thoughtfully by all those who take seriously their responsibilities as Americans for the future growth, prosperity, and security of our country."

THE CHEMIST Chosen as Consistently Helpful

The Laboratory (Vol. 17, No. 1), published by the Fisher Scientific Company, Pittsburgh, lists "Some Valuable Journals on Science and Technology."

"Taken from among several thousand titles, the brief list herewith attempts to identify a few journals which are consistently helpful in their respective fields." THE CHEMIST is included in this list and its editorial policy is well summarized in this brief description:

"THE CHEMIST. Monthly. $2.00. Sixty East 42nd Street, New York 17. This is the official publication of The American Institute of Chemists and it enjoys an imposing array of contributing editors.

"It is less concerned with the mundane problems of industry and the laboratory than with the more intangible matters of policy, ethics, and matters of research and education. In these fields it contributes wise counsel and informed opinion from many eminent leaders in the profession.

"Besides discussing the affairs of the Institute, some of the authors are quite articulate regarding the status of the chemical profession. Under the caption 'Vivid Words Advance Science', one contributor discusses lucidity in writing and gives some examples of prose which is clear and accurate, and calculated to hold the attention.

"Other columns discuss such topics as the expanding responsibilities of the scientist, the place of the federal government in scientific activities, and hampering legislation in regard to research on animals. Some personal notes and industrial news are included. Also included are book reviews, some of which are signed."

Herstein Laboratories Expand

Karl M. Herstein, F.A.I.C., announces that Herstein Laboratories, Inc., have moved from 23 West 47th Street, to larger quarters at 128 Water Street, New York 5, N. Y.

A Guide to the United Nations

Calco Chemical Division, American Cyanamid Company, Bound Brook, N. J., each year sends a July Fourth commemorative mailing piece to its friends and customers. This year, the beautifully printed booklet is entitled, "The United Nations—Its Charter and Organization." In different format, the substance of the booklet is being printed by the United Nations, entitled, "A Guide to the United Nations." Copies may be obtained for fifty cents from International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y.

Jeffrey R. Stewart, F.A.I.C., Stewart Research Laboratory, P. O. Box No. 173, Washington, D. C., announces that the new edition of *National Paint Dictionary* is now available. Eugene F. Hickson, Chief of the Paint, Varnish and Lacquer Section of the National Bureau of Standards, and Dr. Raymond B. Seymour, F.A.I.C., director of the Industrial Research Institute, University of Chattanooga, Tennessee, assisted in the preparation of this new edition, which has been reduced in size to six inches by nine inches, and increased from 216 to 704 pages. Outstanding authorities have contributed suggestions and information. Definitions have been secured directly from scientific and technical men in the industry. Only 3200 copies have been printed. The price is $7.50 per copy.

Evaluators Needed

The Department of Commerce is asking trade and technical associations to suggest persons qualified to evaluate some 500,000 German documents, including 145,000 patent applications in various fields.

Scandinavian Research Journal

Acta Chemica Scandinavica is a new journal dedicated to chemical research in Denmark, Finland, Norway and Sweden. Professor Karl Myrback of Stockholm is editor-in-chief. Papers by Scandinavian scientists will be published in English, French, or German. Ten issues a year are scheduled. Subscriptions are $8.50 year plus postage. Address inquiries to Einar Munksgaard, Norsegade 6, Copenhagen, Denmark.

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Dr. Gustav Egloff, F.A.I.C., was elected president of the Chicago Technical Societies' Council, on June 24th.

On July second, he was installed as vice president of the Western Society of Engineers, at its 78th annual meeting, Chicago.

Charles C. Concannon, F.A.I.C., chief of the Chemical Division, Bureau of Foreign and Domestic Commerce, represented the United States chemical industry at the Eighth International Management Congress held in Stockholm, Sweden, July third to eighth.

For Your Library

THERMODYNAMICS FOR CHEMISTS. By Prof. Samuel Glasstone, (Boston College), 2nd printing, 1947, *D. Van Nostrand Co.*, 522 pp. Price $5.00.

"The object of the present book is to provide an introduction to the principles and applications of thermodynamics for students of chemistry and chemical engineering. All too often it appears that such students tend to regard the subject as an academic and burdensome discipline, only to discover at a later date it is a highly important tool of great practical value. The writer's purpose has been to explain the general structure of thermodynamics, and to give some indication of how it may be used to yield results having a direct bearing on the work of the chemist."

The author has accomplished the purpose, as above set forth in his preface, in a creditable manner. The fundamental laws and principles are clearly enunciated in the text, and at suitable intervals illustrative problems with worked-out answers are introduced. There are also many examples to test the reader's understanding of the text which, from the nature of the subject, is largely numerical and statistical.

The book is, therefore, one to work through rather than read, and the subject is of little use to those who make no effort to put it into practice. This particular volume also makes a fitting companion to a "Textbook of Physical Chemistry" and a "Theoretical Chemistry" by the same author.

TIME, KNOWLEDGE AND THE NEBULAE. By Martin Johnson, Physics Department, Birmingham (England) University. *Dover Publications.* 1947. 189 pp. $2.75.

A remarkably clear, succinct and fascinating account of some of the fundamentals of modern physics and chemistry, a bright light under a bushel of vague title. The description of the second law of thermodynamics is outstanding for clarity and brevity.

The origin of relativity is traced to its source and the distinguishing features of the several "name brands" of relativity are elucidated. The equations which underlie electromagnetic radiation, and which are valid from the frequencies of radio down to those of atoms and electrons, are developed in elementary, readily intelligible form. Instead of deriving the basic relation, "energy is equal to mass times the square of the velocity of light" from the Lorentz transformation, the author traces this same relationship to the *mass per unit volume of the electromagnetic field,* and points out that the varia-

tion in mass of a material particle with its velocity can be derived from the electromagnetic equations as well as by means of the Lorentz transformation.

Prof. E. A. Milne's relativity is characterized by two time scales in which photons (and atoms) keep t (Roman script) time, while macroscopic (and astronomical) bodies keep τ (Greek script) time. The transformation from one time scale into the other is given by,

$$\underset{(\text{tau})}{\tau} = t_0 \log \left[\frac{t}{t_0} \right] + t_0 ,$$

t_0 being the age of the universe at our own situation reckoned in t scale.

The light from distant nebulae shows a considerable displacement of known spectral lines towards the red end of the spectrum. Interpretation of such shifts as due to the Doppler effect implies a fabulous "expanding universe" in which the outer nebulae are rocketing away from the earth at the rate of 2×10^9 cm/sec or 20,000 kilometers per second. Milne relativity offers another explanation of the observed spectral shifts without recourse to the fantastic conception of distant worlds racing away from ours at nearly nine-tenths of the speed of light.

This little book is a veritable compendium of modern science, and this review only grazes some of the high points.

—Dr. E. E. Butterfield, F.A.I.C.

A Laboratory Manual of Qualitative Organic Analysis. By Openshaw. *Cambridge, at the University Press* (*The Macmillan Company, N. Y.*) 1949. 95 pp. $1.50.

This is an extremely short book. It has only ninety-five pages including the index. For readers who want such a brief treatment of the subject, it should be satisfactory. It was compiled for the use of students attending classes in practical organic chemistry in the University of Manchester. The procedure is similar to that of Mulliken and contains little new material.

—Dr. Homer v. B. Joy, F.A.I.C.

Chemical Specialties. A symposium compiled by H. Bennett. (1946) *The Chemical Publishing Company, Inc.* 826 XV pp. Illustrated. $12.50.

This book is a guide to those who wish to enter the chemical specialty business. It imparts certain principles of applied chemistry to the business man and also places essential business information at the disposal of the chemist.

It is a noteworthy contribution to the literature of the chemistry of compounding or "making things" in daily use. Formulations for practical domestic technical and industrial compositions of every type are included. Bennett has assumed leadership in the systematic development of

a basic working literature of "compounding chemistry", which is applied chemistry dealing with the development and improvement of formulas and the seeking of new and profitable applications for them.

The formulations cover the following subjects: Cosmetics, Foods, Drugs and Pharmaceuticals, Polishes and Cleaners, Lubricants, Insecticides and Rodent Poisons, Adhesives, and Inks. Some 900 formulas are given.

A wealth of material is accessible in the extended chapter dealing with processing procedures and equipment. Chapters also cover such subjects as marketing, new products development, general business principles; information concerning the Food, Drug, and Cosmetic Law, the U.S. Insecticide Act, and trade mark regulations. An eighty-two page appendix includes a list of hazardous chemicals, first aid for chemical emergencies, chemical synonyms, tables, and a limited list of dealers in chemicals and supplies.

While this volume was originally intended for compounders who have little or no knowledge of pharmacy or chemistry, it is a practical *"vade mecum"* for those who are trained in these arts. It naturally follows that training is a valuable asset in dealing with raw materials and finished specialties. This excellently printed and well-bound volume is recommended.

—Simon Mendelsohn, F.A.I.C.

CHEMICAL ANALYSES. *Interscience Publishers.* 9¼" x 6¼". Vol. 1. Industrial Poisons, Hazards, and Solvents. By Morris Jacobs. 662 pp. $7.00.

This is an excellent compilation of methods of detection and analyses of materials of a hazardous or poisonous nature.

Vol. 2. Chromatographic Adsorption Analysis. By Harold H. Strain. 222 pp. $3.50. This method of analysis often may be used for the separation of otherwise inseparable materials, with great utility in fields of biological chemistry. An excellent compilation of the literature accompanies the descriptive matter.

Vol. 3. Colorimetric Determination of Traces of Metals. By E. B. Sandell. 487 pp. $7.00. As a handbook of trace analysis, this is excellent.

CALCULATIONS OF ANALYTICAL CHEMISTRY. By Leicester F. Hamilton and Stephen G. Simpson. *McGraw-Hill Book Company,* 1947. 387 pp. 5¾"x8¼". $3.50.

To lift the mathematical computations of the results of analyses out of the ritual of procedure serves a double purpose. It fixes the procedure in mind and concentrates attention on the final result and its utility.

The book might have been enlivened by some dynamic procedures, such

as measuring reaction rates, "catching them on the fly", and thus extending the application of the calculations to those analyses which are the basis of much of physical-chemistry. More than 1000 problems cover the phases of general analytical chemistry.

INTRODUCTION TO THE CHEMISTRY OF THE SILICONES. By Eugene G. Rochow. *John Wiley & Sons.* 137 pp. 6"x9¼". $2.75.

This small volume on the manufacture, properties, and uses of the "organic" silicon compounds is packed full of information.

Following a review of the silanes and their derivatives, the commercially important silicon polymers are treated, including possible future applications. Large-scale production processes are discussed.

This book is rich in data and a stimulus to further work.

—Dr. John A. Steffens, F.A.I.C.

THE NEW FIBERS. By Joseph V. Sherman and Signe Lidfeldt Sherman, F.A.I.C. *D. Van Nostrand Company, Inc.* 537 pp. 5½" x 8½". $5.00.

Natural fibers account for about ninety per cent of total fiber consumption; rayon for about ten per cent, while the synthetic fibers account for only one per cent. The consumption of these synthetic fibers, some of which are superior to natural, will

undoubtedly increase, particularly as chemical research and practical applications continue.

The new fibers are classified into the true synthetics and the semi-synthetics. The former include Nylon, Vinyl Chloride-acetate Copolymer, Vinylidene Chloride Copolymer, Acrylonitrile Copolymers, Polyvinyl Alcohol, Polystyrene, Polyethylene, and Tetrafluoroethylene Polymer. The semi-synthetics include fibers of cellulose-base, protein-base, rubber-base, glass-base, metal-base, and alginate-base.

These new fibers are discussed in the book, from their history and development to processing, application, and future possibilities. Numerous tables cover basic and industrial statistics. Formulas and illustrations are given. A list of 1600 patents issued in the United States during the past ten years is provided. Reference lists follow each chapter, and a fiber trade-name list is included.

This well-done summary of scientific and commercial facts about the new fibers gives a picture of the subject which will inspire and inform those who read it.

Chemical Statistics Directory

" Chemical Statistics Directory No. 1," is a new publication by the Department of Commerce, designed to inform industry of the wealth of statistics on chemicals and related products issued by various branches of the Government.

The directory was planned and compiled by L. N. Markwood, F.A.I.C., and assistants, under the general direction of C. C. Concannon, F.A.I.C., and it is a material contribution to the field of market research.

It is available at 15 cents a copy from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., or from the N. Y. Regional Office, 350 Fifth Avenue, 60th Floor, New York, N. Y.

"How Research Helps Us Grow" is featured in the June, 1947, issue of THE HERCULES MIXER, house organ of Hercules Powder Company. Hercules formerly made explosives exclusively. Through research it now makes over 350 products and supplies many raw materials. Over 600 people work at the Experiment Station alone, and $3,000,000 a year is spent on research. Research is divided into "Service Research", concerned with improving present products; "Development Research," designed to find new products or new uses for products; and "Exploratory Research," which seeks new materials for new markets. Ideas come from customers, salesmen, chemists, operators and executives. Teamwork and organized, cooperative effort are stressed.

Suggested for Professional Reading

"Postwar Research in Mellon Institute." Annual Report of Director, E. R. Weidlein, F.A.I.C., to the Board of Trustees. Table of Contents: Mellon Institute Enters the Postwar Era; The Institute's Research Personnel and Activities in General; The Department of Research in Pure Chemistry; The Department of Research in Chemical Physics; Announceable Advances in Continued Industrial Fellowship Researches; New and Terminated Industrial Fellowships; List of Industrial Fellowships in Operation.

Dr. Gustav Egloff Suggests:

"Engineers Are Also Citizens, the Challenge of Power." by R. M. Gates, president, Air Preheater Corporation, New York. *Mechanical Engineering,* June, 1947. "Let us unleash and develop a civic energy that will entitle our profession to its proper place in the leadership of our communities, our nation, and our world."

"The Shortage of Scientific and Technical Personnel—What Industry Is Doing About It." By Kenneth A. Meade, director of technical employment, General Motors Corporation. An address presented before the American Association for the Advancement of Science, in Boston, December 28, 1946. "By pooling the experience and 'know-how' of employers with that of faculty members . . . of our universities, we will find better ways of producing technical and scientific graduates better qualified to do their jobs and more interested in making these fields a career wherever they choose to accept employment. This cooperative attack from a long range point of view will . . . help to insure more effective use of technical scientific graduates in industry. This may be more important than producing a larger number of graduates, many of whom leave this field of work after they are trained for it. Let us put greater emphasis on producing quality rather than on just increasing the number of graduates in the technical and scientific fields."

Isotopics (published by the Cleveland Section of the American Chemical Society) in its June, 1947, issue features information on the perchloric explosion in Los Angeles. The coroner's verdict, the chief engineer's report, and a resume of the properties of perchloric acid are given.

The sixth edition of Brady's *Materials Handbook* is announced. It describes 7,500 industrial materials and gives data on the economics of materials. Price $7.00. It is published by Industrial Materials Service, P. O. Box 6317, Northwest Station, Washington 15, D. C.

"UOP Laboratory Test Methods for Petroleum and Its Products." Contains practical, modern methods for the refinery laboratory. 350 pp. flexible leatherette bound. Pre-publication price $10.00 per copy. After publication, the price will be $14.00. Order from Universal Oil Products Company, 310 South Michigan Avenue, Chicago 4, Illinois.

Course in Chemical Engineering Economy

Polytechnic Institute of Brooklyn New York, offers the graduate course "Chemical Engineering Economy" during the first semester of the academic year 1947-48. Interested persons should apply to Dean Raymond E. Kirk, Graduate School of Polytechnic, Brooklyn, N. Y.

Chemical Condensates

Ed. F. Degering, F.A.I.C.

Humphrey Davy, when awarded a prize of 3,000 francs by the Institute of France, in 1808 (during the English-French War), for his experiments in 1807 on the galvanic fluid, remarked to a friend: "Some people say I ought not to accept this prize; and there have been foolish paragraphs in the papers to that effect: but if the two countries or governments are at war, the men of science are not. That would, indeed, be a civil war of the worst description; we should rather, through the instrumentality of men of science, soften the asperities of martial hostility." Men of science could, by coming out of their ivory tower of facts, do this very thing.

"The sages do not consider no mistakes is a blessing. They believe rather, that the great virtue of man lies in his ability to correct his mistakes and continually to make a new man of himself."

—Wang Yang-Ming

Professional Services

Any man who does not make himself proficient in at least two languages other than his own is a fool. Such men have the quaint habit of discovering things fifty years after all the world knows about them—because they read only their own language.

——Martin H. Fischer

The wide horizons of tomorrow are in the laboratories of today.

——Sherman Fairchild

Aristotle said, "It is more difficult to organize peace than to win a war; but the fruits of victory will be lost if the peace is not well organized."

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5 Year Guarantee. The manufacturer's certificate goes with every Freas oven. It guarantees the oven against defects in materials and workmanship for five years.

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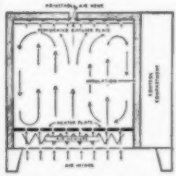
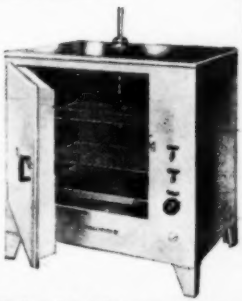
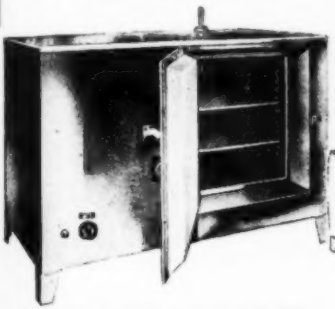
Gravity Convection Models, for general use:

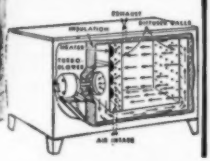




Designed to take every advantage of temperature differentials to speed heat transfer. Ideal for all applications not requiring the advantages of mechanical convection, or where space is at a premium.

Mechanical Convection Models, for greatest efficiency:





Forced air circulation provides uniform heat throughout the oven, quickly and surely. Heat transfer is accelerated, drying time is reduced, oven loading capacity is increased. Air velocity adjustable between 75 and 250 feet per minute.

Precision–Freas Ovens are available in a variety of sizes and in two temperature ranges. They are furnished with adjustable shelves, 0-300° C. thermometer, Neon pilot lamp, and for 115 or 230 volts, A.C. or D.C. current. One popular size has a heating chamber 13" wide, 14" deep, and 13" high, and is priced as follows:

7610—Gravity Convection, 35-180° C.	$170.00
7614—Gravity Convection, 35-260° C.	200.00
7618—Mechanical Convection, 35-180° C.	365.00
7621—Mechanical Convection, 35-260° C.	405.00
7609—Floor stand, 33" high, with shelf	25.00

Full Information on These and Other Models Upon Request

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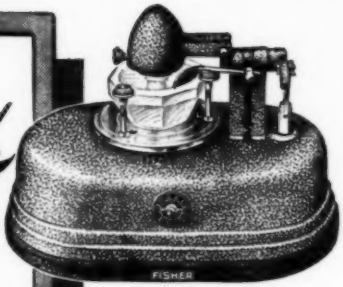

The Fisher Grinder (above) with Kennametal Mortar and Pestle (below) are the modern means of reducing samples.

With the FISHER MORTAR GRINDER

Saves Time
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The Fisher Improved Mortar Grinder is a heavy, electrically-driven device that reduces samples quickly and efficiently—completely eliminating the "long grind" otherwise necessary. Its grinding action is more rapid because the pestle moves from side to side, the removable mortar revolves, and a scraper continually returns the sample into the pestle path.

Almost all materials except the diamond and fibrous or gummy substances can be reduced by the Grinder. It is furnished without mortar and pestle for operation on 110 volts, 60 cycle, A.C.
Each, $140.00

Kennametal Mortar and Pestle, for Mortar Grinder. Much harder than quartz or agate. Will grind garnet, synthetic spinel, etc. **Each, $160.00**

Mullite Mortar and Pestle, for Mortar Grinder. Harder than agate. Will not flake off when grinding such materials as dolomite. **Each, $34.50**

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